DOCUMENT RESUME

ED 301 022 EC 211 769

AUTHOR Brancaleone, Louis
TITLE Attention-Deficit Hyperactivity Disorder: A Step toward Individualized Treatment Planning.
PUB DATE May 88
NOTE 41p.; Doctoral Research Paper in Psychology, Biola University.
PUB TYPE Information Analyses (070) -- Dissertations/Theses - Undetermined (040)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Academic Achievement; Aggression; *Attention Deficit Disorders; Attention Span; Conceptual Tempo; *Educational Diagnosis; Elementary Education; *Etiology; Family Environment; *Hyperactivity; *Intervention; Locus of Control; Social Adjustment

ABSTRACT

The paper reviews research studies on identification and treatment of attention-deficit hyperactivity disorder (ADHD). Studies investigating the three primary ADHD dimensions of inattention, hyperactivity, and impulsiveness are initially cited, followed by a review of research in the related dimensions of cognitive attributions/locus of control, home environment, social behavior/aggression, and academic achievement. It is concluded that the complexity of the ADHD syndrome necessitates a complex, multimodal assessment and a comprehensive, individualized treatment package. A list of 74 references is appended. (JW)

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ATTENTION-DEFICIT HYPERACTIVITY DISORDER: A STEP TOWARD INDIVIDUALIZED TREATMENT PLANNING

A Doctoral Research Paper

Presented to

The Faculty of the Rosemead School of Psychology

Biola University

In Partial Fulfillment

of the Requirements for the Degree

Doctor of Psychology

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by

Louis Brancaleone

May 1988

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ATTENTION-DEFICIT HYPERACTIVITY DISORDER:

A STEP TOWARD INDIVIDUALIZED TREATMENT PLANNING

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ABSTRACT

ATTENTION-DEFICIT HYPERACTIVITY DISORDER:
A STEP TOWARD INDIVIDUALIZED TREATMENT PLANNING

Louis Brancaleone

Attention-deficit Hyperactivity Disorder (ADHD) is a common psychiatric diagnosis in childhood. Research findings indicate several relevant dimensions to be considered in treatment. In addition to the primary dimensions of inattention, hyperactivity and impulsiveness, research findings suggest other dimensions that also warrant careful consideration. This paper reviews the research and treatment considerations for these relevant dimensions. In addition, implications for future research and multimodal treatment are discussed.

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ACKNOWLEDGMENTS

I would like to express my sincere appreciation to the following people:

To Dr. John Fantuzzo, my primary reader, whose guidance and feedback helped to shape and refine this paper into a finished product;

To Dr. William McQueen (Mackie), my secondary reader, who sparked my interest in "hyperkinetic" children, and for his continued personal friendship and professional support;

To my wife, Joan, for her love, patience, prayers, and support during these difficult years in the doctoral program;

To my daughter, Krista, who is too young to know how much "Daddy" loves her;

Finally, to God, in whom all glory ultimately resides.

Attention-deficit Hyperactivity Disorder:
A Step Toward Individualized Treatment Planning

Attention-deficit Hyperactivity Disorder (ADHD) is a common psychiatric diagnosis in childhood. It is estimated that it may occur in approximately three percent of children. The primary features or dimensions of this disorder are developmentally inappropriate degrees of inattention, hyperactivity, and impulsiveness. Most children with this disorder exhibit disturbance in these areas to varying degrees (American Psychiatric Association, 1987).

A review of the history of ADHD reveals major diagnostic difficulties. Theoretically, the reason for developing a specific diagnosis is that there is presumed to be a common etiology, a common, "prescriptive" treatment with a common response to that treatment, and a common course for the disorder. Despite decades of searching, no such homogeneous pattern has been identified (Loney, 1980).

In the early 1900's, hyperactive behavior was closely linked with brain damage, and consequently, with terms such as "brain damage syndrome" and "minimal brain damage." The term of Minimal Brain Dysfunction (MBD) was introduced in the 1960's because many neurologists were stating that "brain damage" should not be inferred from behavioral signs only. Therefore, the term "brain dysfunction" replaced "brain damage" in the diagnostic description (Martin, Welsh, McKay & Bareuther, 1984).

The American Psychiatric Association did not use the global terminology of Minimal Brain Dysfunction because there was a lack of evidence for "brain dysfunction" as a definite etiological factor. Therefore, the Diagnostic and Statistical Manual of Mental Disorders II (American Psychiatric Association, 1968) stuck to a more narrowly defined behavioral concept of "hyperkinetic reaction of childhood or adolescence" or "hyperkinesis." The Diagnostic and Statistical Manual of Mental Disorders III (American Psychiatric Association, 1980) changed the terminology to Attention Deficit Disorder (ADD) with/without Hyperactivity because of the prevailing consensus that attentional problems were a more constant feature of the disorder than hyperactivity (Routh, 1983). In the Diagnostic and Statistical Manual of Mental Disorders III-R, this disorder is now called Attention-deficit Hyperactivity Disorder (ADHD). The change was due to lack of evidence for Attention Deficit Disorder without Hyperactivity as a diagnostic category (American Psychiatric Association, 1987).

As can be seen by the above history, ADHD was previously referred to as "brain damage syndrome," "minimal brain damage," "brain injury," "minimal brain dysfunction," "hyperkinesis," and "attention deficit disorder with/without hyperactivity." These numerous changes indicate that historically mental health professionals have had great difficulty defining this syndrome.

Consequentially, research findings have resulted in confusion rather than a cohesive body of knowledge (Loney, 1980). Even in the current DSM III-R terminology, it is understood that Oppositional Defiant Disorder, Conduct Disorder, and ADHD covary to a high degree (American Psychiatric Association, 1987). Cantwell (1986) postulates that different results of treatment outcome may indicate that there are distinct subgroups of ADHD with differential responses to treatment.

Despite the difficulty in defining and diagnosing ADHD, research findings indicate several relevant dimensions to be considered in treatment. In addition to the three commonly identified dimensions of inattention, hyperactivity, and impulsiveness, research findings suggest other relevant dimensions that also warrant careful consideration. These dimensions include cognitive attributions/locus of control, home environment, social behavior/aggression, and academic achievement. The purpose of this paper is to review research and treatment considerations for these relevant dimensions. In addition, implications for future research and multimodal treatment will be discussed.

Three Primary Dimensions

Inattention

Inattention, evidenced by distractibility and inadequate attention span, is one of the primary dimensions of ADHD. Drug treatment with stimulant medication has

yielded some treatment effects for this dimension. It is well established that the use of these drugs has short-term positive effects on attentional processes, such as, vigilance and reaction time (Barkley, 1977a; 1977b). Unfortunately, improved long-term outcomes of stimulant medication are not well established (Weiss, Minde, Werry, Douglas & Nemeth, 1971).

Despite these documented effects, treatment of ADHD with stimulants is not well-understood by the medical community. Use of stimulant drugs reduces symptoms, although the reasons for this are not clear. The discovery and use of stimulant drugs occurred during the time that this disorder was thought to be related to "brain damage" or "Minimal Brain Dysfunction." Therefore, drug treatment was then assumed to be a medical treatment for an organic disorder.

Supporting organic etiology, it has been hypothesized that "inattention" results from an "overarousal of the brain." This hypothesis states that children with ADHD have great difficulty organizing relevant stimuli and screening out irrelevant stimuli (McMahon, 1984). Therefore, stimulant drugs enhance the impact of external stimulation on the nervous system, which could mean that they will not respond as quickly to internal events and feelings (Hastings & Barkley, 1978).

Despite this reasonable rationale, research evidence supporting the notion of an organic basis for inattention is

inconclusive (McMahon, 1984). The evidence suggests that brain damage increases the risk for "all kinds" of behavioral disturbances, not just attention deficits (Rutter, Graham, & Yule, 1970). This increased risk is nonspecific. Therefore, there is no reason to expect a brain damaged child to show attention deficits more often than some other kind of disturbed behavior (Routh, 1983). In fact, less than five percent of these children show any evidence of neurologic damage (Martin et al., 1984). In addition, it has been found that when normal children with no behavioral or attentional problems take stimulant drugs, they also exhibit a decrease in motor activity, reaction time, and improved performance on cognitive tasks (Rapoport et al., 1978). This suggests that favorable drug response is not necessarily a confirmation of an organic abnormality in children.

Despite the positive effects of stimulants, only 75% of children with ADHD respond favorably to medication. Some researchers have pointed out individual differences that correlate with this differential response. Barkley (1977a) concluded that the presence of this primary dimension of inattention was the most promising predictor of favorable response. In addition, Loney, Prinz, Mishalow and Joad (1978) found that older children tended to respond more favorably than younger ones, and children with more perinatal complications responded better than those with fewer of them.

Since inattentive and disruptive behavior appears to be incompatible with school work, several researchers have shown that these target behaviors can be reduced using behavior modification procedures (Hall, Lund, & Jackson, 1968; Thomas, Becker, & Armstrong, 1968). For example, a child may be induced to sit in his chair and keep his eyes on his schoolwork (Routh & Mesibov, 1980). Despite these successes, Winett and Winkler (1972) have criticized traditional behavior modification in classrooms as being contrary to the goals of the educational process. In addition, reinforcing a child for "paying attention" does not guarantee that any more academic work will be accomplished (Ferritor, Buckholdt, Hamblin, & Smith, 1972). A more successful approach would be to make reinforcement contingent on academic performance which will decrease inattention and disruptive behavior as a side effect (Ayllon & Roberts, 1974).

Hyperactivity

Hyperactivity, evidenced by difficulty remaining seated, excessive running and jumping, fidgeting, and excessively noisy activities is another primary dimension of ADHD. Similar to attentional processes, the short-term positive effects of stimulant drugs on motor activity is well established, but improved long-term outcomes are not well established (Weiss et al., 1971; Barkley, 1977b).

This responsiveness to stimulant medication has led some researchers to suspect organic etiology. However, the rationale for hyperactivity is hypothesized to be due to "underarousal" of the brain, which clearly appears contradictory to the "overarousal" of the brain accounting for the dimension of inattention. The underarousal hypothesis proposes that children with this disorder engage in heightened activity with the environment to increase the amount of auditory and visual stimulation (Ney, 1974). Stimulants are expected to raise the internal arousal of the central nervous system so that hyperactivity is no longer necessary to increase external stimulation. Besides the inconclusiveness of the underarousal hypothesis (McMahon, 1984), favorable drug response for hyperactivity, as with inattention, is not necessarily a confirmation of an organic abnormality in children (Rapoport et al., 1978).

On the other hand, there are some researchers who have proposed that hyperactivity is caused by factors relating to children's diet. Feingold's (1975) book had suggested (on the basis of uncontrolled case history information) that many children's hyperactive behaviors were due to allergic reactions to foods, particularly artificial colors and flavors. Despite these claims, there has not been sufficient evidence to confirm these findings (Routh, 1983). Even so, some children do seem to respond adversely to food dyes (Weiss et al., 1980). In addition, some investigators have found results suggesting that the

consumption of sugar products is related to the amount of destructive-aggressive and restless behavior the child would subsequently exhibit (Prinz, Roberts, & Hantman, 1980). Although these findings are inconclusive, the fact that some children are affected by changes in food consumption underscores the importance of exploring and treating dietary factors in individual cases.

Some researchers have proposed "environmental responsiveness" to be a key factor related to treatment for hyperactivity. Longitudinal studies have been done comparing so-called "true" hyperactive preschoolers who were hyperactive both at home and at school, with "situational" hyperactive preschoolers, who were hyperactive only at home (Campbell, Endman, & Bernfeld, 1977a; Campbell, Endman, & Bernfeld 1977b). It would appear that one group is resistant to environmental changes ("true" hyperactives), and that the other group ("situational" hyperactives) is more responsive to environmental intervention.

One can hypothesize the potential results of different treatment approaches from this finding. "Situational" hyperactives, who were hyperactive only at home, may respond better to behavior modification than "true" hyperactives, who were hyperactive both at home and at school. The reasoning for this is that the "situational" hyperactives appear to be more responsive to changes in the environment. Therefore, behavior modification procedures might be more effective with "situational" hyperactives versus "true"

hyperactives. Further research is needed to confirm or disconfirm this hypothesis.

Impulsiveness

Impulsiveness, another primary dimension of ADHD, is evidenced by children who are inept at modulating their attentional, motoric, and social behaviors and lacking in age-appropriate self-regulation skills (Whalen, Henker & Hinshaw, 1985). A careless, disorganized, nonreflective manner characterizes their cognitive and social functioning (Abikoff, 1985).

The cognitive-behavioral approach views "impulsiveness" as a target behavior and emphasizes the relationship between cognitive mediation and resulting behavior responses. These children are trained to "think before acting" and to problem-solve in a systematic fashion. Therefore, cognitive-behavioral treatment focuses on the development of self-control skills and reflective problem-solving strategies aimed at providing skills for children to regulate their own behavior (Meichenbaum & Asarnow, 1979).

Cognitive-behavioral treatment also emphasizes portable coping strategies that are intended to transfer across behaviors and contexts, thereby enhancing maintenance and generalization of treatment gains (Whalen et al., 1985). This is especially important since it appears that both drug and behavioral treatments are effective only as long as they are given. If the child ceases to receive pills or praise

consistently, his behavior will probably deteriorate (Loney, 1980).

Over a decade of research has produced limited successful findings. In a landmark study, Meichenbaum and Goodman (1971) showed significant improvement in task accomplishment using cognitive training procedures with behavior problem and cognitively impulsive children. Although generalization to academic performance and achievement is rare, some researchers have seen such results (Brown, Wynne, & Medinis, 1985; Douglas, Parry, Marton, & Garson, 1976). Generalization from cognitive task performance to social-adaptive behavior tends not to be found (Brown et al., 1985; Douglas et al., 1976). However, some generalization to social behavior has been noted (Kendall & Braswell, 1982). Hinshaw, Henker, and Whalen (1984) found that cognitive-behavioral treatment enhanced self-regulation in an anger-inducing situation compared to the use of stimulant medication.

Despite the promising expectations and limited successes, Whalen et al. (1985), in a review of the treatment outcome literature, report "the controversial bottom line is that the results of cognitive-behavioral treatment are not very strong, somewhat inconsistent, difficult to replicate and decidely disappointing" (p. 393).

One major reason why results have not been as encouraging as expected is that there have been few attempts

to fashion cognitive-behavioral programs systematically on the basis of individual subject differences. Some personal characteristics that may be relevant are types and severity of problem behaviors, social skills level, developmental level, therapeutic rapport, expressive language abilities, metacognitive skills, preexisting self-regulation competencies, IQ, self-perceived efficacy, causal attributions for success and failure, motivation for change, and the quality of the child's school and home environments (Abikoff, 1985; Bugental, Whalen, & Henker, 1977; Cohen, Sullivan, Minde, Novak, & Helwig, 1981; Copeland, 1982; Meichenbaum & Asarnow, 1979; Schleser, Cohen, Meyers, & Rodick, 1984). Each element on this list should be considered when designing and implementing cognitive-behavioral treatments for individual children.

Another reason for the lack of expected results is that not much is known about the cognitive strategies and self-regulational deficits of children with ADHD. Proponents of cognitive-behavioral treatment have not produced adequate means of diagnosing or documenting the cognitive mediators assumed to underly target problems. Also lacking is information about the particular steps in the problem-solving chain that pose difficulties. There are multiple components and stages of any problem-solving activity and any aspect of this sequence may be problematic for a particular child (Whalen et al., 1985). There is a

significant need for greater specificity in defining and assessing the specific deficits of individual children.

One such important individual characteristic that could have profound effects on the effectiveness, maintenance and generalization of cognitive-behavioral treatment is "cognitive maturity." There is reason to suggest that treatment plans need to be tailored according to the children's level of cognitive development. Piaget's model of cognitive development (Flavell, 1985) is useful for understanding these factors. Cognitive immaturity has already been given as a possible reason for treatment failure for some studies (Cohen et al., 1981; Eastman & Rasbury, 1981). These studies used 5 to 6-year-old kindergarteners and 1st graders, respectively.

The fact that time and practice is more necessary for younger children, as well as the idea that treatment tasks need to be similar to real-life experiences makes sense from a cognitive/developmental view. According to Piaget, cognitive functioning under age twelve is characterized by more concrete-reasoning processes. It is not until the next stage of cognitive development, formal operations, that children are able to use abstract-reasoning processes. In this stage they are able to utilize insight-oriented interventions. Before the formal operational stage, in-vivo experience and treatment similar to real-life situations will probably have the most pervasive effect on performance and behavior.

In addition, cognitive-behavioral treatment may not be appropriate for everyone and every situation. Self-instructional procedures may interfere with tasks requiring speed and also tasks that have already been mastered (Abikoff, 1985). Weithorn and Kagen (1979) found that teaching new training strategies may interfere with already established, efficient problem-solving skills. This suggests the importance of matching training stategies with preexisting problem-solving skills. Friedling and O'Leary (1979) make the suggestion that self-instructional training may be most effective with previously mastered skills that are not optimally performed. In addition, since overt self-talk can be disruptive in a group or classroom setting, these children also need to learn how to discriminate when "not" to use the procedures or to use them covertly (Whalen et al., 1985).

Also, the focus on "deautomatizing" and systematic reflectiveness may not be a proper intervention for children who already tend toward anxiety and obsessional thought patterns. In addition, the message of assigning personal responsibility for the outcome on this kind of child may produce debilitating guilt in the child if things go wrong or may cause the parents to blame the child for failures that are not under his personal control (Whalen et al., 1985).

Other relevant dimensions

In addition to the three primary dimensions, research points to other dimensions that are related to Attention-deficit Hyperactivity Disorder (ADHD).

Cognitive Attributions/Locus of Control

Bugental, Whalen, and Henker (1977) derived interesting conclusions about the role of attributions in the interaction between self-control treatment (cognitive-behavioral), social reinforcement treatment (behavioral), and medication (pharmacological). They compared a self-control treatment and a social reinforcement treatment of medicated vs. unmedicated hyperactive children. Children who attributed high personal causality to themselves (internal locus of control) and unmedicated children did better on the experimental task (Porteus mazes) under the self-control intervention. In contrast, children who attributed low causality to themselves (external locus of control) and medicated children showed a trend toward more error reduction under the social reinforcement condition.

One case illustration giving attention to cognitive attributions used in conjunction with the discontinuance of drug therapy was reported by Rosen, O'Leary, and Conway (1985). Despite the methodological limitations of case studies, it provides some interesting hypotheses. The abrupt cessation of stimulant therapy in a 9-year-old boy named Tom resulted in rapid behavior deterioration, as well

as spontaneous attributional statements such as "I get angry without my pill" and "my pills help me get my work done." After 4 days, Tom was given placebo pills and his task attention and productivity returned to high levels. Subsequently, the teacher also attempted "reattribution therapy" by emphasizing that Tom, not the pills, was controlling his behavior. Tom was later taken off the placebo and continued to perform well in the classroom.

The cases above support that notion that all interventions have implicit message values, quite apart from their observable behavioral impact (Henker, Whalen, & Hinshaw, 1980). For example, cognitive-behavioral training, because of its emphasis on self-control, conveys a message of personal efficacy that may be particularly beneficial for hyperactive children and their families. On the other hand, the implicit message of medical treatment may convince hyperactive children that outcomes in their life experiences are relatively independent of their actions. They may come to believe that their good behavior is solely a result of taking the medication, which discourages them from relying on their own developing competencies (Whalen et al., 1985; Whalen & Henker, 1980). Similar attributional effects might also occur with behavioral interventions that implicitly promote the externalization of credit and responsibility for problem solutions (Whalen et al., 1985).

If these attributional ideas are not explicitly considered during treatment, they might become counter-therapeutic, hindering the maintenance or generalization of treatment gains. Attention to the attributions of these children should probably supplement stimulant drug and behavioral treatments. However, it should be noted that the personal control message must be synchronized with developing self-regulatory competencies so that they will experience success. If expectations for personal control exceed the child's actual abilities, fragile self-perceptions could be damaged (Whalen et al., 1985). In addition, the attributions toward medication that are referred to as potentially detrimental, can in the short-run be helpful to enhance medication effects or to maintain appropriate behavior. This has often been called the "placebo" effect (Whalen et al., 1985).

The Bugental et al. (1977) study cited above suggests that children's own attributional style may contribute to the treatment of choice. Behavioral change may be optimized when the child's causal attributions match the implicit attributional emphases of a given intervention. In this case, a child who attributes high personal causality may respond better to self-control interventions, and a low personal causality child is probably more sensitive to the environment which fits the implicit assumption of behavior therapy.

Although further research is required, the cognitive attributional process deserves special attention as a relevant dimension of ADHD. It is possible that cognitive/affective attributions could be one of the most important factors involved in differential treatment outcomes across individuals.

Home Environment

Ney (1974) suggested that certain children (called conditioned hyperactive) might have had parents who were selectively attending to their active, distracting behavior. In this case, the child is reinforced with attention only when he is hyperactive. It was postulated that this child would more often have a depressed single parent and be more frequently distressed. He might also be described as looking desperately for approval. Besides behavioral interventions, prognosis was also seen by Ney to be dependent on the treatment of the mother's depression.

Another category Ney (1974) delineates is the "chaotic hyperactive" child who comes from a home environment where there is little agreement on discipline or where there is considerable marital turmoil. Being "on the move" is a way of adapting to and avoiding the friction in the home. Unpredictability in the environment increases anxiety and restlessness. These children would be given corporal punishment more frequently and have a high incidence of antisocial behavior. Prognosis usually depends on how effectively chaos in the home can be resolved.

In addition, there seems to be some support for the idea of an interdependence between biological risk factors and the characteristics of the home environment in determining a variety of behavioral and educational outcomes (Werner & Smith, 1982). Lambert and Hartsough's (1984) findings suggest the importance of a match or mismatch between the child's emerging temperament and the home environment. They found that although biological (prenatal or perinatal stress) and demographic factors (low socioeconomic status) may predispose children to being identified and treated as hyperactive, the major contributions to the outcome of actually being identified as hyperactive is more dependent on the quality of the home environment and the interactions of the child's temperament with the home environment, rather than just on the biological and demographic factors alone.

These findings support the notion that home environment is another dimension that should be attended to in understanding ADHD. In certain individual cases, a parent's depression or some other pathology might need intervention. Chaotic home environments might be handled by teaching the parents effective parenting techniques. Most clinicians would probably agree that the hyperactive child responds poorly to a loose, unstructured home environment, and requires an environment of simplicity and consistency (Martin et al., 1984; Patterson, 1982).

Lambert and Hartsough's (1984) article cited above seems to underscore the necessity of developing interventions to assist families in coping with difficult children and emphasizes the importance of the interaction of a variety of parenting practices with early manifestations of individual differences in temperament and subsequent personality development.

Social behavior/Aggression

Unfortunately, the effects of stimulant drugs on social behavior and aggression are not well established. Cunningham and Barkley (1978) found that stimulant medication increased the children's amount of solitary play and decreased the number of social interactions initiated. The mother was also more responsive to the interactions that the child did initiate, suggesting that they were more socially appropriate. Cunningham and Barkley (1979) also found that Ritalin not only increased the child's rate of compliant behaviors, but also decreased the number of maternal commands and led to more positive interactions between mother and child.

In contradiction to the above results, Ullmann and Sleator (1985) found that stimulant medication has a major effect in improving attention and in decreasing activity level, but only has a minor effect on deficient social skills and oppositional (aggressive) behavior. Not only has stimulant treatment been disappointedly lacking in showing consistent improvement in immediate social behavior, it has

been discouraging that drug treatment has not been associated with improved adolescent outcomes on many variables, including aggression (Weiss et al., 1971). Loney, Kramer, and Milich (1979) postulate that aggressive behavior is unaffected by stimulant drug treatment. Therefore, no matter how successful drug treatment is in reducing attention or hyperactivity, it is not associated with good adolescent outcomes.

In addition, studies using sociometric ratings have uniformly found hyperactive children to receive greater peer rejection than other children (Klein & Young, 1979; Mainville & Friedman, 1976). It is likely that poor peer relationships could stem from deficient and immature social skills or an aggressive response style. These findings are of special concern because peer problems are one of the best predictors of adult psychopathology (Cowen, Pederson, Babigian, Izzo, & Trost, 1973).

These findings suggest that treatment efforts should be directed specifically at reducing children's aggressive behavior and at ameliorating adverse environmental circumstances associated with aggression, that is, family pathology and economic disadvantage (Loney, 1980). In addition, direct behavioral observations are needed in order to understand the interpersonal transactions that occur that earns these children the rejection they often receive. In this respect, social skills training for these children could also be very beneficial (Routh, 1983).

Aggression can also be viewed as a sort of developmental delay. The normal child increases in the empathic appreciation of the effects of his or her behavior on other people's feelings. Therefore, tantrums, noncompliance, physical and verbal aggression, and frequent violations of social norms generally give way to greater sensitivity to other people and better socialized behavior. The child with conduct problems does not develop such empathic sensitivity, or at least impulsively disregards such considerations in his or her behavior (Routh, 1983). The child may also develop a bias to attribute hostile motives to others and to act on those attributions (Nasby, Hayden, & DePaulo, 1980). Routh (1983) noted that most behavioral treatment approaches have generally focused directly on contingency management of the aggressive or delinquent youth's behavior (Patterson, 1974; Phillips, 1968). Routh suggested that the underlying affective and cognitive processes are a more fundamental difficulty here.

This hypothesis of "arrested affective development" suggests that psychodynamic theory may contribute to our understanding and treatment of this disorder. The psychodynamic approach takes into account the child's internal experience of reality, constrained by developmental restrictions such as cognitive development. The plausible assumption of this approach is that most of the child's experiences as a youngster are emotional in nature because

of the absence of verbal and cognitive abilities. Even before the child's first words are spoken, emotional learning is occurring. Significant emotional development has occurred long before cognitive capacities are sufficient to form verbal structures connected with those emotional experiences. In other words, emotional experience is often in a "preverbal" state within the individual's psyche. The psychodynamic therapist views the early disruption of emotional development as the cause for this hyperactive behavior.

Although the following view is not consistently accepted by all psychodynamic theorists, it is one purported viewpoint. The hyperactive/conduct-disordered child appears to act impulsively on his internal feeling-states rather than allowing cognition to mediate the behavior process. In simple terms, the child has not learned to "think" about his feelings. This ability to think in this capacity is facilitated by "emotional containment," which might have been missing in the child's earliest experiences with caretakers. The healing process is the working-through or the "rethinking/reexperiencing" of early, sometimes overwhelming, emotional experiences, some that might have occurred before the child spoke his or her first word. This occurs in the context of a long-term therapeutic relationship. Greater self-control is attained as the child becomes more able to "think" about his current feelings and early experiences, facilitated by disconfirming emotional

experience in the therapeutic relationship. For a more detailed exposition of this approach, see Grinberg, Sor, & Tabak de Bianchedi (1977).

Psychodynamic therapy typically does not produce quick answers to problems of this kind and is usually a long-term form of treatment. To date, there is no substantial empirical documentation for the effectiveness of this approach. This approach warrants rigorous empirical validation given that it may account for internalizing processes that may affect ADHD.

Academic Achievement

Unfortunately, despite the short-term behavioral effects of stimulant drugs, there is little evidence for lasting effects on children's academic achievement (Gittelman, 1980; Lerer, Lerer, & Artner, 1977; Rie & Rie, 1977). In fact, research findings suggest that the use of stimulant drugs actually interferes with academic performance, and therefore, some researchers conclude that behavioral intervention is far preferable to the pharmacological approach (Ayllon, Layman, & Kandel, 1975; Shafto & Sulzberger, 1977; Wulbert & Dries, 1977).

On the other hand, there are some researchers who believe that achievement deficits are primary to and responsible for children's hyperactivity. Therefore, they maintain that treatment directed toward hyperactivity itself leaves the central problem unaffected (Cunningham & Barkley, 1978). Eisenberg (1978) stated the viewpoint that although

behavioral modification can reduce disruptive symptoms in the classroom and in the home, remedial education for achievement problems must be the central component in the treatment.

One study that involved a preventive approach was done by Arnold et al. (1977). Eighty-six first graders were screened from a larger group as being vulnerable to academic failure and behavioral difficulty. Then they were randomly assigned to either an intervention group which received individually tailored educational tutoring, a contact control group, or a no-contact control group. At the conclusion of the treatment and even to a larger extent at follow-up one year later, the intervention group surpassed the others on IQ measures and in reading performance, and had lower hyperactivity and conduct disorder scores.

More remedial educational research of this kind is a must because it suggests that helping the at-risk child with difficulties in school achievement at very early ages could significantly influence their behavioral outcomes.

Discussion

The DSM III-R criteria for Attention-deficit Hyperactivity Disorder (ADHD) focuses mainly on the three primary dimensions of inattention, hyperactivity and impulsiveness. These dimensions have been found to be present in varying degrees with ADHD children. Other features or dimensions associated with this disorder are

given only brief mention. This paper, which reviewed the research in this area, suggests that there are other relevant dimensions to be considered that are also present to varying degrees.

To date, no study has assessed all of these dimensions. In fact, currently there is little agreement on how to operationalize the various symptoms and features that comprise this disorder. Therefore, major work is still needed to construct an operational diagnostic system that will provide a multimodal assessment of these relevant dimensions (Loney, 1980).

Once comprehensive, multimodal procedures are available, the next logical step would be to design individualized treatment programs that are responsive to the multidimensional needs of ADHD children. The manifold nature of the dimensions will necessitate a multimodal treatment program that will result in greater treatment effectiveness.

Satterfield and his colleagues (1979, 1980, 1981) have taken some pioneering steps toward a multimodal approach. Satterfield, Satterfield, and Cantwell (1981) offered individual and group psychotherapy for the children and their parents, family psychotherapy, and medication as indicated to 100 families with hyperactive boys. Two groups were analyzed at follow-up. Those who dropped out of treatment within two years were compared with those who participated in the program for two to three years. The

group that received more treatment had better school adjustment and home relations, less antisocial behavior, were closer to age achievement and intelligence achievement, and were globally more improved as rated by the treating psychiatrist, parents and the hyperactive child. This piloting effort provides some evidence for the efficacy and promise of this extended, multimodal approach.

Improving the quality of the research in this area is an important step toward expanding and clarifying the dimensional information provided in this paper and for developing a multimodal approach. Because of the vague and varied definitions of this disorder, much of the current research in this area is contradictory, unreliable, uninterpretable, and difficult to replicate in a clear fashion (Routh, 1983). Children who have been "categorically" diagnosed with ADHD vary too greatly along the syndrome dimensions to permit adequate interpretation of research findings. This is a major methodological problem that hinders research.

Brown, Borden and Clingerman (1985) noted numerous other methodological limitations in their review of empirical studies evaluating combined pharmacological and nonsomatic treatment with hyperactive children. For example, in seven of the thirty studies critiqued, treatment was provided to all children in the study. In the absence of untreated comparison groups, pre-test/post-test differences are not unequivocally demonstrated to be

attributable to the treatments examined. Five of the thirty studies critiqued failed to find that treatment was significantly better than placebo or no treatment. The small number of children in each of the treatment groups limits confidence in the conclusions drawn from these studies. In three of the studies, psychotic and retarded children were included among those who received treatment. Such characteristics are clearly confounding variables that could account for differential response to treatment.

In addition, noncomparable research designs make direct comparisons of the research exceedingly difficult. Brown et al. (1985) suggest that the research design used for all treatment outcome studies should at least include appropriate control groups, random assignment of patients to treatment, double-blind conditions, standard dosages of medication, and standardized evaluation. These minimum standards should bring some consistency to the research, thereby making the results across studies more interpretable.

Mash and Dalby (1979) have advocated well-controlled studies that examine the effectiveness of "specific" medication interventions for "specific" populations with "specific" symptoms, in particular situations. Well-designed treatment outcome studies with homogenous groups of children who are similar on the dimensions discussed in this paper would be a much-needed step toward providing more interpretable data and clinically meaningful information.

Rather than using children who are "categorically" diagnosed, a "dimensional" diagnosis would seem to be more clinically and empirically helpful. This would ultimately facilitate movement in the direction of Paul's (1967) question towards which all outcome research should be directed: "What treatment, by whom, is most effective for this individual with that specific problem, and under which set of circumstances" (p.111).

In conclusion, the complexity of ADHD necessitates a complex, multimodal assessment of relevant dimensions and a comprehensive treatment package designed to respond to the multiple needs of these children. This multimodal approach would be more responsive to the research findings in the current ADHD literature. Researchers and clinicians need to recognize the importance of a multimodal approach and follow the lead of Satterfield and his colleagues by simultaneously considering all relevant dimensions to this disorder. This multimodal approach will result in optimal, cost-effective treatment.

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